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MARINE ALGÆ OF THE NEW JERSEY COAST AND ADJACENT WATERS OF STATEN ISLAND.

By Isaac C. Martindale, Camden, N. J.

(Read June 11, 1889).

The issue of Harvey's "Nereis Boreali Americana" in 1852–1857 by the Smithsonian Institute at Washington, was the first publication bearing on the marine algæ of the New Jersey coast; this does not show that collections were made much south of Long Branch. The fact was doubtless that up to that date very few persons indeed had collected on the more southern shores of the State. Samuel Ashmead, living at Beesley's Point, had during previous years made some study of the marine flora in his immediate vicinity, and there was published in the Report of "The Geology of the County of Cape May," issued in 1857, "A Catalogue of Marine Algæ discovered at Beesley's Point during the summer of 1855, by Samuel Ashmead, Esq." enumerating 29 species. Prof. W. G. Farlow issued in 1871–1872 a "List of the sea weeds or Marine Algæ of the south coast of New England." In 1875–1876 he also issued lists of the "Marine Algæ of the United States." In the Report of the U. S. Fish Commission for 1879, was issued "Marine Algæ of New England and adjacent coast," by Prof. Farlow; which is the best publication bearing directly on the marine flora of the New Jersey coast.

In the Bulletin of the Torrey Botanical Club, July, 1886, Col. Nicholas Pike of Brooklyn published a "Check List of Marine Algæ, based on specimens collected on the shores of Long Island from 1839 to 1885." From time to time notes on

our marine flora have appeared in the same journal, but no attempt has been heretofore made to classify the collections on the New Jersey coast, except a bare list by A. B. Hervey in the "Preliminary Catalogue of the Flora of New Jersey," by N. L. Britton. F. S. Collins contributed to the December, 1888, No. of the BULLETIN an account of "Algæ from Atlantic City N. J. collected by S. R. Morse," giving a list of the species obtained from 1884 to 1888 inclusive.

The following list is based on the notes and collections of the writer, made during the past twenty years. Besides which Col. Pike has kindly furnished a list of "Algæ observed by Nicholas Pike on the New Jersey coast and collected by him between the years 1840 and 1886." Also a "List of the Marine Flora of Staten Island," prepared by himself. None of the specimens collected by him have been seen by me and are here given entirely on the authority stated. Prof. S. R. Morse of Atlantic City has collected very extensively in the waters of that section. The late Prof. Rachel L. Bodley of Philadelphia published some sketches in the columns of the "Public Ledger" of Philadelphia, on the collections made while spending a holiday season at Longport, six miles below Atlantic City. The first collections made at that place were by Mrs. H. M. Lawton, and Mrs. E. H. McCullough, who have proved themselves to be experts in the mounting of specimens, a number of which have been made into "souvenirs of Longport," and sold in the bazaars of Atlantic City and elsewhere. Miss A. R. Murphy of Germantown, Pa., subsequently collected quite extensively there, also at Atlantic City, and has been fortunate in obtaining some of the finest specimens yet seen on the coast. Miss Carrie A. Boice made a collection at Ocean Grove; Mrs. Nancy J. Gardner at Asbury Park; and Mrs. Lucy H. Porter, M.D., of Philadelphia, has made quite an extensive collection at Somer's Point and at Atlantic City. The late Halliday Jackson of West Chester, Pa., collected a few specimens at Cape May and other points of the coast. Dr. N. L. Britton has made considerable collections at Staten Island and about New York harbor; a number of other persons have from time to time added to the knowledge of our sea coast flora by their contributions. This list embraces 91 genera, 183 species and 41 varieties.

Nearly the whole of those collected in the waters about Atlantic City have been identified or examined either by Prof. Farlow or Frank S. Collins of Malden, Mass. The latter spent a few days at that point examining the collections of Prof. Morse, aud studying the finer forms found at the Inlet and Thoroughfare. The writer is greatly indebted to him for his generous and kindly aid, always furnished whenever called upon, and without which this list could not have been made as complete as it now is. The Geological Survey of New Jersey is to be congratulated that the valuable services of this eminent algologist have been thus obtained.

Among the microscopic forms of Marine Algæ some species may yet be detected on our shores, but the list embraces all the species known or said to have been collected on our coast. The herbarium of the Academy of Natural Sciences of Philadelphia has been examined in the preparation of this list; and the writer desires to return his sincere thanks to the numerous persons who have kindly allowed him to examine their collections, and to express the hope that this publication may be the means of awakening an interest in, or an incentive to a closer study of our flora by many of the thousands who spend some portion of the year at the numerous sea-side resorts of our State.

CRYPTOPHYCEÆ.

CHROOCOCCUS, Næg.

C. TURGIDUS, Næg. "Pier at Stapleton, S. I.; on rocks in brook near Silver Lake. Spring and summer." *Pike.*

XENOCOCCUS, Thuret.

X. SCHOUSBŒI, Thuret. Growing on *Lyngbya luteo-fusca.* Atlantic City, *Martindale.* Mr. Collins says, "this is the first time it has been reported on this coast."

GLŒOCAPSA (Kütz), Næg.

G. CREPIDINUM, Thuret.

On wharves, Atlantic City, *Morse*, *Martindale;* Staten Island, *Pike.*

ENTOPHYSALIS, Kütz.

E. GRANULOSA, Kütz. On old shells, Atlantic City, *Morse;* Mr. Collins says "not previously reported on the American coast."

POLYCYSTIS, Kütz.

P. PALLIDA, Kütz.

On decaying algæ. Atlantic City, *Morse.*

P. ELABENS, Kütz. "Prince's Bay, Staten Island," *Pike.*

CLATHROCYSTIS, Henfrey.

C. ROSEA-PERSICINA, Cohn.

On mud and small pebbles, Atlantic City, *Morse, Martindale;* Staten Island, *Pike.* It has occasionally been seen on fish in the Philadelphia market, which were said to have been caught on the New Jersey coast.

SPIRULINA, TURPIN.

S. TENUISSIMA, Kütz. Atlantic City, mixed with *Oscillaria,* etc., *Morse;* Swimming River, Monmouth Co., *Britton;* Staten Island, *Pike.*

BEGGIATOA, Trev.

B. ALBA, Trev.

Var. MARINA, Warming. On leaves and stems of *Spartina,* in brackish ditches, Atlantic City, *Martindale;* Staten Island, *Pike.*

B. ARACHNOIDEA, Rab.

With the former, Atlantic City, *Martindale.*

LEPTOTHRIX, Kütz.

L. RIGIDULA, Kütz. Growing on other algæ, Atlantic City, *Morse, Martindale.*

OSCILLARIA, Kütz.

O. SUBULIFORMIS, Harv. In brackish ditches and pools, Atlantic City, *Morse, Martindale;* Staten Island, *Pike.*

O. SUBTORULOSA (Brèb.), Farlow.

With the former, Atlantic City, *Morse, Martindale.*

O. LIMOSA, Kütz, var. CHALYBEA, Kütz. "Stapleton and Tompkinsville, Staten Island," *Pike.*

MICROCOLEUS, Desmaz.

M. CHTHONOPLASTES, (Fl. Dan.), Thuret. In brackish pools, Atlantic City, *Morse, Martindale.*

LYNGBYA, Ag.

L. MAJUSCULA (Dillw.), Harv. Cape Cod to Key West, common, *Farlow* in Mar. Alg. New England; Newark Bay, *Pike;*

Cape May, *Martindale.* On stems of floating *Zostera*, Atlantic City, *Morse.*

L. ÆSTUARII (Jürg.), Liebm. Salt ditches at Hoboken, *Prof. Bailey* in Ner. Bor. Am.; Perth Amboy, *F. Wolle;* on floating *Zostera*, Atlantic City, *Morse;* salt ditches, Cape May, *Martindale;* common in salt ponds and marshes, Newark Bay, *Pike.*

L. LUTEO-FUSCA (Ag.), J. Ag. Hoboken and Staten Island, *Pike.* On wharves between tide marks, Atlantic City, *Martindale, Morse.*

L. TENERRIMA, Thuret. On wharves, Atlantic City, *Morse.*

L. NIGRESCENS, Harv. "Prince's Bay, Staten Island," *Pike.*

CALOTHRIX, Ag.

C. CONFERVICOLA (Roth), Ag. New York Bay, *J. Hooper* in "Introduction to Algology, with a catalogue of American Algæ," Brooklyn, 1850; Hoboken, Communipaw, Staten Island, *Pike.* On stems of *Fucus vesciculosus*, Atlantic City, *Morse, Martindale.*

C. CRUSTACEA (Schousb.), Born. and Thur. On stems of *Fucus, Morse, Martindale.*

C. SCOPULORUM (Web. and Mohr), Ag. Hoboken, Staten Island and Beesley's Point, *Pike;* on wharves, Atlantic City, *Morse, Martindale.*

C. PULVINATA (Mert.), Ag. On wharves, Atlantic City, *Morse, Martindale.*

RIVULARIA (Roth), Ag.

R. ATRA, Roth. On stones, Atlantic City, *Martindale.*

R. POLYOTIS (J. Ag.), Bornet and Flahault. (*R. hospita*, Thuret.) On exposed roots of *Spartina*, Atlantic City, *Morse.*

R. NITIDA, Ag. (*R. plicata*, Carm.), "Prince's Bay, Staten Island," *Pike.*

ISACTIS, Thuret.

I. PLANA (Harv.), Thuret. On stones and old oyster shells, Atlantic City, *Morse, Martindale.*

BRACHYTRICHIA, Zau.

B. QUOYI (Ag.), Bornet and Flahault, (*Hormactics Quoyi*, Ag.). A specimen thought to be of this species was collected at Atlantic City, *Morse.*

ANABÆNA, Bory.

A. TORULOSA (Carm.), Lagerheim, (*Sphærozyga Carmichælii*, Harv.). Camden, *H. C. Wood, Jr.* in Fresh Water Algæ of America; on decaying algæ, Atlantic City, *Morse, Martindale;* Newark Bay, *Pike.*

NODULARIA, Mertens.

N. HARVEYANA, Thuret. "Mariners' Harbor, Staten Island," *Pike.*

ZOOSPOREÆ.

MONOSTROMA (Thuret), Wittr.

M. BLYTII (Aresch.), Wittr. A specimen thought to be of this species was collected on woodwork exposed to the waves, Atlantic City, *Morse.*

M. CREPIDINUM, Farlow. On wharf pilings, Atlantic City, *Morse.*

M. GREVILLEI (Thuret), Wittr. "Prince's Bay, Staten Island," *Pike.*

M. PULCHRUM, Farlow. "Common all around Staten Island," *Pike.*

ULVA (L.), Le Jolis.

U. LACTUCA (L.), Le Jolis. Common in bays along the whole coast.

Var. RIGIDA (Ag.), Le Jolis. Atlantic City, *Martindale, Morse;* Staten Island, *Pike.*

Var. LACTUCA, Le Jolis. Atlantic City, *Martindale, Morse;* Longport, *Mrs. Lawton;* Staten Island, *Pike.*

Var. LATISSIMA, Le Jolis. Common, Beesley's Point, *Ashmead*, and in bays along the whole coast. At Longport the fronds are often of unusual size; three feet long and fully as wide.

U. ENTEROMORPHA, Le Jolis. Common in bays along the whole coast, in a great variety of forms.

Var. LANCEOLATA, Le Jolis. Atlantic City, *Morse, Martindale, Miss A. R. Murphy;* Longport, *Lawton;* Staten Island, *Pike*

Var. INTESTINALIS, Le Jolis. Asbury Park, *Mrs. N. T. Gardner;* Atlantic City, *Morse, Martindale, Murphy;* Longport, *Lawton, Mrs. E. H. McCullough;* abundant

in Little Bay, *Ashmead;* Beesley's Point, *Ashmead, Harvey;* Somer's Point, *Mrs. L. H. Porter;* Cape May, *Martindale.*

Var. COMPRESSA, Le Jolis. With the last named variety and equally abundant, growing on shells, stones and wood, between tide-marks.

U. MARGINATA (J. Ag.), Le Jolis. Atlantic City, *Morse*, on wharf between tide-marks.

U. AUREOLA, Ag. Atlantic City, *Morse, Collins.*

U. PERCURSA, Ag. Atlantic City, *Morse, Martindale*, on wharves, between tide-marks.

U. CLATHRATA, Ag. Beesley's Point, *Ashmead, Harvey*; Atlantic City, *Morse, Martindale;* Ocean Grove, *Miss Carrie A. Boice;* Longport, *Lawton;* New York Bay, *Pike.*

Var. UNCINATA, Le Jolis. Atlantic City, *Morse, Martindale.*

Var. ERECTA, Le Jolis. Atlantic City, *Morse, Martindale.*

Var. PROSTRATA, Le Jolis. Atlantic City, *Morse, Martindale.*

Var. CRINITA, Hauck. (*Enteromorpha crinita*, J. Ag.). Atlantic City, *Martindale.*

All these varieties grow on shells and stones between tide-marks.

U. HOPKIRKII (McCalla), Harv. Staten Island, *Pike;* Atlantic City, on old shells, *Morse, Martindale.*

ULOTHRIX (Kütz.), Thur.

U. FLACCA (Dillw.), Thur. On wharves, Atlantic City, *Martindale, Morse.*

U. ISOGONA (Engl. Bot.), Thuret. New York Bay, *Harvey;* Common at Fort Hamilton in spring, *Harvey;* on wharves, Atlantic City, *Morse, Martindale;* Staten Island, *Pike.*

Mr. Morse collected at Atlantic City a very slender form, which Mr. Collins states may possibly be distinct from either of these species.

CHÆTOMORPHA, Kütz.

C. ÆREA (Dillw.), Kütz. New York Bay, *Hooper*, in Harvey Ner. Bor. Am.; common at Beesley's Point, *Pike.*

C. PICQUOTIANA (Mont.), Kütz. Staten Island, *Torrey* in

Harvey, Ner. Bor. Am.; Communipaw, Prince's Bay, S. I. and Long Branch, *Pike;* washed ashore at Atlantic City, *Martindale*, *Murphy*.

C. LINUM (Flor. Dan.), Kütz. Staten Island, *Pike;* Atlantic City, *Martindale*, *Morse;* washed ashore at Longport, *McCullough;* at Beesley's Point, *Ashmead*. In the summer of 1887 I collected at Somer's Point a form with unusually large fronds, which must be of this species although the cells were very much larger than common. Intermediate forms also occur.

C. MELAGONIUM (Web. and Mohr), Kütz. Atlantic City, *Morse, fide Collins*. A slender short-jointed form, probably due to the locality being at the extreme southern range of this species.

RHIZOCLONIUM, Kütz.

R. SALINUM (Schleich.), Kütz. (*R. riparium*, Roth.). On exposed *Spartina* roots, Atlantic City, *Martindale*, *Morse*.

R. KOCHIANUM, Kütz. On *Zostera*, Atlantic City, *Martindale;* Somer's Point, *Porter*.

R. TORTUOSUM, Kütz. "Prince's Bay, S. I.," *Pike*.

CLADOPHORA, Kütz.

C. ARCTA (Dillw.), Kütz. New York Bay, *Walters*, in Harv. Ner. Bor. Am.; common on south shore of Staten Island, *Pike*.

C. LANOSA (Roth.), Kütz. "Prince's Bay, S. I.," *Pike*.

C. RUPESTRIS, Kütz. "Communipaw and Prince's Bay, S. I.," *Pike*.

C. ALBIDA (Huds.), Kütz. Staten Island, New York Bay, Beesley's Point, Cape May, *Harvey*, Ner. Bor. Am.; Communipaw, *Pike;* Atlantic City, *Morse*.

C. REFRACTA (Roth), Aresch. New York, *Harvey*, Ner. Bor. Am.; South Beach, S. I., *Britton;* Atlantic City, *Morse;* floating in the bay at Longport, *Lawton;* Newark Bay, *Pike*.

C. GLAUCESCENS (Griff.), Harv. New York Bay, *Harvey*, Ner. Bor. Am.; Beesley's Point, *Ashmead;* Atlantic City, *Morse;* Staten Island, *Pike*.

C. LÆTEVIRENS (Dillw.), Harv. New York Bay, *Harvey*,

Ner. Bor. Am ; Communipaw, Staten Island, Beesley's Point, *Pike.*

C. HUTCHINSIÆ (Dillw.), Kütz. In tide pools, Atlantic City, *Morse, Martindale, Murphy;* Longport, *McCullough, Lawton, Miss Jennie Hood.*

C. FLEXUOSA (Griff.), Harv. In tide pools, Atlantic City, *Martindale, Morse* ; Longport, *Lawton.*

C. MORRISIÆ, Harv. Elsinborough, Delaware, *Miss Morris,* in Harvey, Ner. Bor. Am. This may be a typographical error, as there is an Elsinborough in Salem Co. N. J.

C. RUDOLPHIANA (Ag.), Harv. Communipaw and Pleasure Bay, and Prince's Bay, S. I., *Pike.*

C. GRACILIS (Griff.), Kütz. Beesley's Point, *Ashmead*; New York Bay, *J. Hooper*; brackish pond at New Dorp, Staten Island, *Britton*; Atlantic City, *Morse, Martindale, Murphy*; Longport, *Lawton* ; Asbury Park, *Gardner.*

Var. EXPANSA, Farlow. Atlantic City, *Morse.*

C. EXPANSA, Kütz. In brackish pools, Atlantic City, *Morse, Martindale*; Longport, *McCullough.*

C. FRACTA (Fl. Dan.), Kütz. New York, *Harvey*; in the Hudson, near West Point, *Bailey*; Beesley's Point, *Ashmead*; Atlantic City, *Morse*; floating at Key East, *Gardner*; Staten Island, *Pike.*

C. FALCATA, Harv. "Occurs plentiful in Little Bay, Cape May Co.," *Ashmead.* This may be only *C. gracilis.*

A quantity of the new genus *Acroblaste*, Reinsch, Farlow, Mar. Alg. New Eng., p. 57, the species not determined, has been collected at Atlantic City, *Morse, Martindale.*

BRYOPSIS, Lamourx.

B. PLUMOSA (Huds.), Ag. Attached to old shells and other submerged substances on the shores of Great Egg Harbor Bay, *Ashmead;* New York Bay, *Chamberlin;* Staten Island, *Torrey Herb.;* common near New York, *Harvey, Pike;* in muddy ditches, Atlantic City, *Morse, Martindale;* Longport, *Murphy, Martindale, Miss Hood.*

B. HYPNOIDES, Lamourx. "On the ferry bridge, Jersey City, just below the water line, 1850," *Pike.* Not otherwise known in our waters.

DERBESIA, Sol.

D. TENUISSIMA (De Not.), Crouan. South shore of Staten Island, *Britton*, *Pike*.

PHYLLITIS (Kütz.), Le Jolis.

P. FASCIA (Fl. Dan.), Kütz. Fort Hamilton, New York Harbor, *Pike* in Harvey Ner. Bor. Am.; also collected by *Col. Pike* at Long Branch; Atlantic City, *Morse*, *Martindale;* Longport, *Lawton*.

Var. CÆSPITOSA. Atlantic City, *Morse*, *Martindale*.

SCYTOSIPHON (Ag.), Thur.

S. LOMENTARIUS (Lyngb.), J. Ag. British America to Charleston, S. C., *Harvey;* on stones between tide-marks, Atlantic City, *Morse;* Staten Island, *Pike*.

PUNCTARIA, Grev.

P. LATIFOLIA, Grev. Fort Hamilton, New York, *Harvey;* Perth Amboy, *Harvey*, *Britton;* Atlantic City, *Morse*, *Martindale;* Staten Island, *Pike*.

Var. ZOSTERÆ, Le Jol. Fort Hamilton, N. Y., *Harvey*, *Pike;* Communipaw, *Pike;* Atlantic City, *Morse*, *Martindale;* Longport, *Lawton*.

P. PLANTAGINEA (Roth), Grev. On piling between tide-marks, Atlantic City, *Morse*, *Martindale*.

DESMARESTIA, Lamourx.

D. ACULEATA (L.), Lamourx. Communipaw, Staten Island and Beesley's Point, *Pike*.

D. VIRIDIS (Fl. Dan.), Lamourx. New York Bay, *J. Hooper;* common in Prince's Bay, Staten Island, Pleasant Bay and at Sandy Hook, *Pike*.

DICTYOSIPHON, Grev.

D. FŒNICULACEUS (Huds.), Grev. On stones and on other algæ near low water mark, Atlantic City, *Morse;* Longport, *Lawton;* New York Bay, *J. Hooper;* common at Prince's Bay, Staten Island, *Pike*. Variable, some forms approaching var. *flaccidus*, Aresch., were collected at Atlantic City, *Morse*.

MYRIOTRICHIA, Harv.

M. CLAVÆFORMIS, Harv. Communipaw, Staten Island and Pleasure Bay, *Pike;* on *Zostera*, Atlantic City, *Martindale*, *Morse;* Longport, *Martindale*, *McCullough*.

Var. FILIFORMIS, Farlow. With the type.

ECTOCARPUS, Lyngb.

E. TOMENTOSUS (Huds), Lyngb. Atlantic City, *Morse*.

E. GRANULOSUS (Eng. Bot.), Ag. Atlantic City, on an old mast, *Morse*.

Var. TENUIS, Farlow. Atlantic City, *Martindale*.

E. CONFERVOIDES (Roth), Le Jolis. Occurs sparingly on shores of Little Bay, on rockweed, *Ashmead;* New York Bay, *Hooper;* south shore of Staten Island, *Britton*, *Pike;* Atlantic City, *Morse*, *Martindale;* Longport, *Murphy*, *McCullough*, *Dr. Porter*.

Var. SILICULOSUS, Kjellman. Common in the bays on *Zostera*, disappearing in July, Beesley's Point, *Ashmead;* on *Spartina* roots in tide pools, Atlantic City, *Martindale*, *Morse;* Ocean Grove, *Boice;* Longport, *Lawton*.

E. FASCICULATUS, Harv. Communipaw, Prince's Bay, Staten Island and Perth Amboy, *Pike*.

E. LUTOSUS, Harv. Staten Island and Pleasure Bay, *Pike*.

E. LITTORALIS, Lyngb. Abundant in the bays of Egg Harbor, *Ashmead;* south shore of Staten Island, *Britton*, *Pike;* Atlantic City, *Morse*, *Martindale*, *Murphy;* on wood work exposed to the waves, Longport, *Martindale*, *Lawton*.

Var. RAMELLOSUS, Hauck. Atlantic City, *Collins*, *Morse*.

E. TERMINALIS, Kütz. Atlantic City, *Martindale*, *Morse*.

SPHACELARIA, Lyngb.

S. CIRRHOSA (Roth), Ag. Shore of Staten Island, on *Cystoclonium*, *Britton;* also reported by *Pike*.

CLADOSTEPHUS, Ag.

C. VERTICILLATUS (Lightf.), Ag. Staten Island, *Pike*.

MYRIONEMA, Grev.

M. VULGARE, Thur. Common on various algæ and occasionally found on stones along the entire New Jersey coast, *Pike;* on *Ulva*, Atlantic City, *Martindale*, *Morse*.

ELACHISTEA, Duby.

E. FUCICOLA (Velley), Fries. Common along Staten Island, *Pike;* on *Fucus*, Atlantic City, *Morse*, *Martindale;* Longport, *Martindale*, *McCullough*.

LEATHESIA, S. F. Gray.

L. DIFFORMIS (L.), Aresch. Staten Island, *Pike;* on wood work at low water mark, Atlantic City, *Morse, Martindale;* sometimes on other algæ, Longport, *Lawton, McCullough.*

CHORDARIA, Ag.

C. FLAGELLIFORMIS (Fl. Dan.), Ag. Staten Island, *Harvey* Ner. Bor. Am., *Pike;* Atlantic City, *Morse.*

MESOGLOIA, Ag.

M. DIVARICATA (Ag.), Kütz. Very common from Cape Cod southward, *Farlow;* New York Bay, *Hooper;* Pleasure Bay, *Pike.*

CASTAGNEA (Dub. and Sol.), Thur.

C. VIRESCENS (Carm.), Thur. A specimen of this species is said to have been collected on the beach at Long Branch; if so, it must have been washed in by the waves from the coast of New England.

RALFSIA, Berkeley.

R. VERRUCOSA (Aresch), J. Ag. On old shells, Atlantic City, *Martindale, Porter.*

R. CLAVATA (Carm.), Crouan. Atlantic City, *Morse, Martindale;* Longport, *Martindale;* Somer's Point, *Porter.*

ASPEROCOCCUS, Lamourx.

A. ECHINATUS (Mert.), Grev. "All around Staten Island." *Pike.*

STILOPHORA, J. Ag.

S. RHIZODES, Ag. Egg Harbor, rather rare on old shells, near low water mark, *Ashmead;* Staten Island, *Pike.*

S. PAPILLOSA, J. Ag. "Great Egg Harbor Bay and Pleasure Bay," *Pike.* Not otherwise known on our coast; possibly only a form of the former species.

STRIARIA, Grev.

S. ATTENUATA, Grev. "Prince's Bay, S. I.," *Pike.* See Farlow, Mar. Alg. p. 90.

CHORDA, Stack.

C. FILUM (L.), Stack. Perth Amboy, *Hervey, Britton;* Ocean Beach, *C. Henry Kain.*

LAMINARIA, Lamourx.

L. SACCHARINA (L.), Lamourx. "Cast up from deep water on

the New Jersey coast, its southern limit not ascertained below Long Branch," *Harvey;* on the beach at Asbury Park in great abundance in 1887, *N. T. Gardner;* Atlantic City, *Morse;* and occasionally at Longport, *Martindale;* New Dorp, S. I., *Britton.*

L. DIGITATA (L.), Lamourx. "Prince's Bay, S. I.," *Pike.*

ALARIA, Grev.

A. ESCULENTA, Grev. "Found only once at Prince's Bay, S. I., probably washed from Montauk Point, much decomposed, end of summer," *Pike.*

OOSPOREÆ.

ASCOPHYLLUM (Stack), Le Jolis.

A. NODOSUM (L.), Le Jolis, (*Fucus nodosus*, L.). New York Bay, shores of Staten Island, *Pike;* Atlantic City, *Morse, Martindale;* Longport, washed up in great abundance in 1887, *Martindale;* sparingly in 1888, *McCullough;* Sandy Hook, *Britton.*

FUCUS (L.), Decne. & Thur.

F. VESICULOSUS, L. Common on the whole coast; the fronds very variable.

Var. LATERIFRUCTUS, Grev. With the type.

Var. SPIRALIS. With the type.

F. EDENTATUS, De La Pylaie? (*F. evanescens* of Farlow Marine Algæ N. E.) Atlantic City, *Morse, Collins.*

F. CERANOIDES, L. "Sailors' Snug Harbor, S. I.," *Pike.*

SARGASSUM, Ag.

S. VULGARE, Ag., frequently washed ashore along the entire coast.

Var. MONTAGNEI, Atlantic City, *Martindale, Morse;* quite abundant at Longport in 1887, *McCullough, Porter, Martindale;* also at Somer's Point, *Porter.*

S. BACCIFERUM (Turn.), Ag. Frequently washed ashore, Atlantic City, *Martindale;* Longport, *McCullough, Bodley.*

VAUCHERIA, D.C.

V. THURETII, Woronin. Muddy ditches, Atlantic City, *Morse.*

V. LITOREA (Hoffman), Bang. On gravel stones, Atlantic City, *Morse, Martindale.*

FLORIDEÆ.

TRENTEPOHLIA (Ag.), Prings.

T. VIRGATULA (Harv.), Farlow. On other algæ and on *Zostera*, Atlantic City, *Morse*, *Martindale;* Longport, *Lawton.*

T. DAVIESII (Dillw.), Harv. On *Chætomorpha Melagonium*, Atlantic City, *Morse, fide Collins.*

PORPHYRA, Ag.

P. LACINIATA (Lightf.), Ag. (*P. vulgaris*, *Harv.*). Common along the shores of New York Bay and Harbor. On *Zostera* in Little Bay, Egg Harbor, very rare, *Ashmead;* Atlantic City, *Morse*, *Martindale;* Longport, *Lawton*, *McCullough*, *Martindale.*

P. LEUCOSTICTA, Thur. Atlantic City, *Morse*, vide F. S. Collins in Bull. Torrey Bot. Club, xi. 132; Longport, *Lawton*, *McCullough*, *Martindale.*

BANGIA, Lyngb.

B. FUSCO-PURPUREA (Dillw.), Lyngb. On wharves, Atlantic City, *Morse*, *Martindale*, *Murphy;* Staten Island and Pleasure Bay, *Pike.*

ERYTHROTRICHIA, Aresch.

E. CERAMICOLA (Lyngb.), Aresch. Atlantic City, *Morse*, *Martindale*, *Murphy;* Longport, *Martindale*, *McCullough.*

E. CILIARIS (Carm.), Thuret. In company with *Trentepohlia Daviesii*, Atlantic City, *Morse, fide Collins.* Has not been previously reported on the coast from any point north of South Carolina.

GONIOTRICHUM, Kütz.

G. ELEGANS (Chauv.), Zanard. Atlantic City, *Morse*, mixed with *Bangia;* detected by F. S. Collins.

HILDENBRANDTIA, Nardo.

H. ROSEA, Kütz. "Very common on stones from Hoboken to Sandy Hook, *Pike.*"

SPERMOTHAMNION, Aresch.

S. TURNERI (Mert.), Aresch. "Communipaw and Staten Island," *Pike.*

CALLITHAMNION, Lyngb.*

*C. ROTHII (Engl. Bot.), Lyngb. Common from New York northward, *Farlow* in Mar. Algæ New Eng., but so far as I know has not definitely been detected in New Jersey waters.

C. CRUCIATUM, Ag. Red Hook, New York, *Harvey* Ner. Bor. Am.; Communipaw and Staten Island, *Pike;* Atlantic City, *Morse, Martindale;* Longport, *Lawton, McCullough, Murphy, Martindale.* The rare cystocarpic fruit is quite common at Atlantic City, *Collins.*

C. AMERICANUM, Harv. From New Jersey northward, *Farlow;* on the New Jersey Flats and on Staten Island, *Pike;* Atlantic City, *Morse, Martindale.*

C. PLUMULA (Ellis), Lyngb. Long Branch, *Miss E. C. Morris* in Harvey Ner. Bor. Am.; Staten Island and Communipaw, *Pike;* Atlantic City, *Morse.*

C. BORRERI (Engl. Bot.), Harv. New York, *Harvey;* very common at Sailors' Snug Harbor, Staten Island and Communipaw, *Pike;* Atlantic City, *Morse, Martindale, Porter, Murphy;* Longport, *Lawton, McCullough, Miss J. Hood, Martindale, Murphy;* Somer's Point, *Porter;* Cape May, *Halliday Jackson, Martindale.*

C. ROSEUM (Roth), Harvey. New York Harbor, *A. R. Young* in Farlow Marine Algæ New Eng; Prince's Bay, Staten Island, and Pleasure Bay, *Pike;* Atlantic City, *Morse, Collins, Martindale.*

C. POLYSPERMUM, Ag. Rare on old shells in Great Egg Harbor Bay, *Ashmead;* Staten Island and Communipaw, *Pike.*

C. TETRAGONUM (With.), Ag. Fort Hamilton and Red Hook, New York Bay, and it probably grows on the New Jersey shore, *Pike.*

C. BAILEYI, Harv. Common from New Jersey to Cape Cod, *Farlow;* New Brighton, S. I. and abundant in New York Bay, *Harvey;* common at Staten Island, *Pike.*

C. BYSSOIDEUM, Arn. New York Harbor, *Harvey;* Port Richmond and New Brighton S. I., *B. B. Chamberlain, Pike;* frequent on *Zostera* and attached to old shells in Great Egg Harbor Bay, *Ashmead;* Atlantic City, *Martindale, Morse, Murphy;* Jersey City and Hoboken, *H. Jackson;* Longport, *Lawton, McCullough, Martindale, Murphy;* Somer's Point, *Porter;* Cape May, *Martindale.* The forms

of this species are numerous, but the definite varieties have not been separated.

C. CORYMBOSUM (Engl. Bot.), Lyngb. "Communipaw and Staten Island," *Pike.*

C. DIETZIÆ, Hooper. "Communipaw and Staten Island," *Pike.* This may be incorrectly determined, see Farlow's Manual, page 9.

C? TENUE (Ag.), Harv. Beesley's Point, Cape May Co., *Ashmead* in Harvey Ner. Bor. Am.; Pleasure Bay, Communipaw, and at Stapleton, *Pike;* Atlantic City, *Morse, Martindale;* Longport, *Lawton, McCullough;* Somer's Point, *Dr. Porter.* All the specimens found thus far are sterile, so that the true genus still remains unsettled.

GRIFFITHSIA, Ag.

G. BORNETIANA, Farlow. Communipaw, Staten Island and Pleasure Bay, *Pike.*

HALURUS, Kütz.

H. EQUISETIFOLIUS, Kütz. "New Jersey coast near New York," *Pike.* According to Farlow's Manual this must be very doubtful.

PTILOTA, Ag.

P. ELEGANS, Bonnem. Squan Beach, N. J., *Miss Morris* in Harvey, Ner. Bor. Am.; Sandy Hook, *Pike;* very large specimens at Sea Bright, 1883, *H. Averill;* Ocean Grove, *C. A. Boice;* Asbury Park, *Louisa Emily Knight;* Atlantic City, *Morse, Martindale;* Longport, *Lawton, McCullough.*

P. PECTINATA (Gunnar), Kjellman. (*P. serrata*, Kütz.) Asbury Park, *Louisa Emily Knight*, 1886. The only specimen so far as known coming from N. J. waters.

CERAMIUM, Lyngb.

C. RUBRUM (Huds.), Ag. Cape Cod to Charleston, *Harvey;* New York harbor, *H. Jackson, N. Pike;* abundant on *Zostera* and quite variable, Beesley's Point, *Ashmead;* Atlantic City, *Morse, Martindale, Murphy, Porter;* abundant on south shore of Staten Island, *Britton;* Ocean Grove, *C. A. Boice;* Somer's Point, *Porter;* Longport, *Lawton, McCullough, Martindale, Murphy.*

Var. PROLIFERUM, J. Ag. Asbury Park, *N. T. Gardner;* Atlantic City, *Martindale.*

Var. SECUNDATUM, Ag. Atlantic City, *Martindale.*

Var. SQUARROSUM, Harv. Atlantic City, *Martindale.*

C. CIRCINNATUM, Kütz. "Prince's Bay, S. I., Aug. and Sept." *Pike.*

C. DIAPHANUM (Lightf.), Roth. Sparingly, Beesley's Point, *Ashmead;* Atlantic City, *Morse, Martindale;* Longport, *Lawton, McCullough, Murphy.*

C. STRICTUM (Kütz.), Harv. Common from New York to Cape Cod, *Farlow,* Mar. Alg. New Eng.; Communipaw and Pleasure Bay, *Pike;* Asbury Park, *C. H. Kain;* Ocean Grove, *C. A. Boice;* Atlantic City, *Morse, Martindale, Murphy, Porter;* Longport, *Lawton, McCullough, Martindale;* Somer's Point, *Porter;* Cape May, *H. Jackson.*

C. FASTIGIATUM, Harv. New York Bay, *Chamberlin, Pike;* Long Branch, *Miss Morris* in Harvey Ner. Bor. Am.; in dense tufts on *Zostera,* rather rare, Beesley's Point, *Ashmead;* Atlantic City, *Morse, Martindale;* Asbury Park, *N. T. Gardner;* Somer's Point, on *Rhabdonia, Martindale, Porter.*

C. TENUISSIMUM (Lyngb.), J. Ag. Staten Island, *Pike;* Ocean Grove, *C. H. Kain, C. A. Boice;* Asbury Park, *N. T. Gardner;* Atlantic City, *Morse, Martindale;* Longport, *Lawton, McCullough, Martindale.*

Var. ARACHNOIDEUM, J. Ag. Atlantic City, *Martindale.*

Var. PATENTISSIMUM, Harv. Atlantic City, *Morse, Martindale.*

SPYRIDIA, Harv.

S. FILAMENTOSA (Wulf.), Harv. Common from Cape Cod southward, *Farlow;* abundant in bays at Egg Harbor, *Ashmead;* Staten Island and Communipaw, *Pike;* Atlantic City, *Morse, Martindale;* Longport, *Martindale, McCullough.*

PHYLLOPHORA, Grev.

P. BRODIÆI (Turn.), J. Ag. Communipaw and Prince's Bay, *Pike;* Asbury Park, *N. T. Gardner;* Atlantic City, *Morse, Martindale.*

P. MEMBRANIFOLIA (Good. & Woodw.), J. Ag. New York, *Hooper, Calverly* in Harvey Ner. Bor. Am.; Long Branch, *Miss Morris* in same; Staten Island and Pleasure Bay, *Pike;* Asbury Park and Ocean Beach, *N. T. Gardner;* Ocean Grove, *C. A. Boice;* Atlantic City, *Morse, Martindale.*

GYMNOGONGRUS, Mart.

G. TORREYI (Ag.), J. Ag. New York, *Prof. Agardh;* Staten Island, *Pike.*

AHNFELDTIA, Fries.

A. PLICATA (Huds.), Fries. New York, *Calverly* in Harvey Ner. Bor. Am.; Staten Island and Sandy Hook, washed ashore, *Pike.*

CYSTOCLONIUM, Kütz.

C. PURPURASCENS (Huds.), Kütz. Squan, *Miss E. Morris* in Harvey Ner. Bor. Am.; New York Bay, *J. Hooper;* abundant on south shore of Staten Island, *Britton;* Atlantic City, *Morse, Martindale.*

Var. CIRRHOSA, Harv. Ocean Grove, *C. A. Boice.*

GIGARTINA, Lamourx.

G. MAMILLOSA (Good. & Woodw.). J. Ag. "Prince's Bay, S. I.," *Pike.*

CHONDRUS, Stack.

C. CRISPUS (L.), Stack. Collected at Staten Island in 1860 by *John Hooper*, according to Col. N. Pike; Atlantic City, *Morse.*

RHODYMENIA (Grev.), J. Ag.

R. PALMATA (L.), Grev. On *Laminaria* at Long Branch, *Pike;* Atlantic City, *Morse.*

EUTHORA, J. Ag.

E. CRISTATA, J. Ag. Staten Island, *Farlow*, Marine Alg. New Eng.; Prince's Bay, S. I., *Pike;* Long Branch, *J. Walters, J. Hooper.*

LOMENTARIA (Gaill.), Thuret.

L. UNCINATA, Menegh. Common from Cape Cod southward, *Farlow;* Staten Island, *Pike;* frequent on *Zostera* and *Ulva*, Beesley's Point, *Ashmead;* Somer's Point, *Porter, Martindale;* Atlantic City, *Morse, Martindale, Murphy;* Longport, *Lawton, Murphy, McCullough.*

Var. FILIFORMIS, Harv. Atlantic City, *Morse, Martindale ;* Longport, *Lawton, McCullough, Martindale,* and an extreme form, possibly var. *robusta,* Harvey.

Var. VALIDA (Harv.) Longport, *Martindale.*

L. ROSEA (Harv.), Thuret. "Stapleton, S. I.," *Pike.*

CHAMPIA, Ag.

C. PARVULA (Ag.), Harv. Common from Cape Cod southward, *Farlow ;* plentiful in Little Bay, *Ashmead ;* Staten Island, *Pike ;* Asbury Park, *Gardner ;* Ocean Grove, *C. A. Boice, C. H. Kain ;* Atlantic City, *Morse, Martindale, Murphy, Porter ;* Longport, *Lawton, McCullough, Martindale, Murphy ;* Somer's Point, *Porter, Martindale.*

HYPNEA, Lamourx.

H. MUSCIFORMIS (Wulf.), Lamourx. Sandy Hook, *Pike ;* washed ashore, Atlantic City, *Murphy ;* Longport, *Lawton.*

GELIDIUM, Lamourx.

G. CRINALE (Turn.), J. Ag. Red Hook, N. Y., *Harvey ;* on old shells in Little Bay, Egg Harbor, *Ashmead ;* New York Bay, *J. Hooper ;* Communipaw, *J. Walters, Pike ;* on piling below high water, Atlantic City, *Morse, Martindale ;* Somer's Point, *Martindale, Porter.*

RHABDONIA, Harv.

R. TENERA, Ag. Common on shores of Staten Island, *Chamberlin ;* Long Branch, *Miss Morris* in Harvey Ner. Bor. Am.; very common on shores at Egg Harbor Bay, *Ashmead ;* Somer's Point, *Porter ;* Atlantic City, *Morse, Martindale, Murphy ;* Longport, *Lawton, McCullough, Murphy, Martindale ;* Cape May, *Martindale, H. Jackson, Miss H. C. Bond ;* Ocean Grove, *Gardner, Miss Boice ;* on all shores about New York Harbor, *Pike.*

POLYIDES, Ag.

P. ROTUNDUS (Gmel.), Grev. Growing on rocks near Stapleton, south shore of Staten Island, *Pike.*

GRINNELLIA, Harv.

G. AMERICANA (Ag.), Harv. New Brighton and New Dorp, Staten Island, *Britton, Pike ;* Fort Hamilton, *Chamberlin ;* a single specimen in Great Egg Harbor Bay, *Ashmead ;* Ocean Grove, *C. A. Boice ;* Asbury Park, *Gardner, L. E.*

Knight ; Atlantic City, *Morse, Martindale, Miss Ray S. Comly, Murphy ;* Longport, *Lawton, McCullough, J. Hood, Martindale, Miss Murphy*, who collected in the summer of 1888 some of the finest specimens ever seen on our coast.

DELESSERIA, Lamourx.

D. SINUOSA (Good. and Woodw.), Lamourx. Long Branch and at Prince's Bay, S. I., *Pike ;* Sea Bright, *Horace Averill ;* Ocean Grove, *C. A. Boice ;* Atlantic City, *Morse.*

D. ALATA (Huds.), Lamourx. "Stapleton, S. I.," *Pike.*

D. LEPRIEURII, Mont. Fort Lee, N. Y., *Horace Averill*, etc., in Farlow Mar. Alg. New Eng ; Atlantic City, on piling, *Morse, Martindale ;* Longport, *Martindale.*

GRACILARIA, Grev.

G. MULTIPARTITA, J. Ag. Common from Cape Cod southward, *Farlow ;* shores of Staten Island, *Chamberlin, Pike ;* Long Branch, *Miss Morris ;* Atlantic City, *Morse, Martindale, Murphy, Porter ;* Longport, *Lawton, McCullough, Murphy, Martindale ;* Somers Point, *Porter ;* plentiful in Egg Harbor Bay, particularly on planted oysters, *Ashmead ;* frequent in New York Bay, *Hooper.*

Var. ANGUSTISSIMA, Harv. Same localities, but less abundant. Cape May, *Martindale.*

CHONDRIOPSIS, J. Ag.

C. DASYPHYLLA (Woodw.), J. Ag. Plentiful in Little Bay and on Bond's Bar, growing in large tufts on sandy mud, *Ashmead ;* Staten Island, *Pike ;* Atlantic City, *Martindale ;* Longport, *McCullough, Murphy, Martindale.*

C. TENUISSIMA (Good. and Woodw.), J. Ag. Common with the last, Egg Harbor, *Ashmead ;* Asbury Park, *Gardner ;* Atlantic City, *Morse, Martindale, Murphy ;* Longport, *Lawton, McCullough, Martindale, Murphy ;* Somer's Point, *Porter, Martindale ;* Staten Island, *Pike.*

Var. BAILEYANA, Farlow. Atlantic City, Longport and Somer's Point, same collectors ; New York Harbor, *Prof. Bailey, Pike ;* Fort Hamilon, *H. Jackson.*

C. ATROPURPUREA (Harv.), J. Ag., var. FASCICULATA, Farlow. Fort Hamilton, N. Y., *Harvey*, Farlow Mar. Alg. New Eng.; Prince's Bay, S. I. and Pleasure Bay, *Pike.*

RHODOMELA, Ag.

R. SUBFUSCA (Woodw.), Ag. Staten Island, *Harvey ;* New York Bay, *Hooper ;* Prince's Bay, Staten Island, *Britton, Pike.*

Var. GRACILIOR, J. Ag. "South shore of Staten Island, April and May," *Pike.*

POLYSIPHONIA, Grev.

P. URCEOLATA (Dillw.), Grev. From New Jersey northward, *Farlow ;* Long Branch, *Miss Morris,* in Harvey Ner. Bor. Am. ; Atlantic City, *Morse, Martindale, Murphy ;* Staten Island, *Pike.*

Var. FORMOSA, Ag. Fort Hamilton, etc., in New York Bay, *Harvey ;* Cape May, *H. Jackson ;* Atlantic City, *Morse.*

P. SUBTILISSIMA, Mont. Hoboken, 1861, *J. Hooper ;* Communipaw and Staten Island, *Pike.*

P. OLNEYI, Harv. On *Zostera* in Egg Harbor Bay, *Ashmead ;* very abundant in Pleasure Bay in August and September, *Pike ;* Ocean Beach, *C. H. Kain ;* Atlantic City, *Martindale, Morse ;* Cape May, *H. Jackson.*

P. HARVEYI, Bailey. Abundant in bays and on Bond's Bar, Egg Harbor, *Ashmead ;* Staten Island, *Pike ;* Atlantic City, *Morse, Martindale, Murphy ;* Asbury Park, *Gardner ;* Ocean Grove, *C. H. Kain ;* Longport, *Lawton, McCullough, Murphy, Martindale, Porter ;* Somer's Point, *McCormick.*

P. FIBRILLOSA (Dillw.), Grev. Longport, *Lawton, Martindale.*

P. VIOLACEA (Roth), Grev. Fine specimens collected at Prince's Bay, Staten Island, *Pike.*

P. VARIEGATA (Ag.), Zan. Common from Cape Cod to West Indies, *Farlow ;* New York, *Hooper ;* Egg Harbor, *Ashmead ;* Staten Island, Asbury Park, Atlantic City, Longport, all collectors ; unusually large and fine specimens, Somer's Point, *Porter.*

P. ATRORUBESCENS (Dillw.), Grev. Long Branch, *Miss Morris ;* Asbury Park, *Gardner ;* Atlantic City, *Martindale, Morse ;* Communipaw and Staten Island, *J. Hooper, Pike.*

P. NIGRESCENS (Dillw.), Grev. Staten Island, Fort Hamilton

and New York, *Pike ;* abundant, Egg Harbor, *Ashmead ;* Ocean Grove, *Miss Boice, Gardner, Kain ;* Atlantic City, *Morse, Martindale, Murphy, Porter ;* Longport, *Lawton, McCullough ;* the latter secured some of the finest specimens yet found on the coast.

Var. FUCOIDES, Ag. Atlantic City, *Martindale ;* Longport, *McCullough.*

Var. AFFINIS, Ag. Atlantic City, *Martindale, Murphy ;* Longport, *McCullough.*

Var. DURKEEI, Harv. Atlantic City,, *Murphy, Martindale.*

Var. PLUMOSA, Harv. Longport, *McCullough,* very fine.

P. FASTIGIATA (Roth), Grev. Pleasure Bay, Communipaw and Staten Island, *Pike.*

BOSTRYCHIA, Mont.

B. RIVULARIS, Harv. Fort Lee, *H. Averill,* in Farlow Mar. Alg. New Eng ; on piling at the drawbridge, Atlantic City, *Morse, Martindale, Murphy ;* floating in the thoroughfare, *Porter ;* Longport, *Lawton, McCullough, Martindale.*

DASYA, Ag.

D. ELEGANS (Mart.), Ag. Common in New York Bay at Communipaw and Staten Island, *Britton, Pike ;* Atlantic City, *Morse, Martindale ;* floating in the thoroughfare, *Porter ;* Longport, *Lawton, McCullough, J. Hood, Murphy, Martindale.* The specimens collected by Miss Murphy in the summer of 1888 were very large and in very fine condition.

CORALLINEÆ.

CORALLINA (L.) Lamourx.

C. OFFICINALIS, L. Said to have been collected at Long Branch.

JANIA, Lamourx.

A specimen of this genus was collected at Longport in the summer of 1888 attached to *Sargassum,* washed up on the beach ; possibly *J. rubens,* Lamourx, or *J. Cubensis,* Mont., but not sufficiently developed to determine with certainty.

MELOBESIA, Lamourx.

M. LE JOLISII, Rosanoff. Atlantic City, *Murphy*, *Martindale*, *Morse*.

M. FARINOSA, Lamourx. On the New Jersey coast and along Staten Island, *Pike;* Atlantic City, *Morse*, *Martindale*, *Miss H. C. Bond*.

M. PUSTULATA, Lamourx. Same stations and same collectors; Somer's Point, *Porter;* Longport, *Martindale*.

M. LENORMANDI, Aresch. Staten Island, *Pike;* Long Branch, Longport and Atlantic City, *Martindale*.

M. MACROCARPA, Rosanoff. Staten Island, *Pike*.

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